Before the
FEDERAL COMMUNICATIONS COMMISSION
Washington, DC 20554

In the Matter of	)	
	)	
Rural Digital Opportunity Fund	)	WC Docket No. 19-126
	)	
Connect America Fund	)	WC Docket No. 10-90
	)	

COMMENTS OF BIG RIVER COMMUNICATIONS

Big River Communications ("Big River") hereby provides these comments in response to the Federal Communications Commission's ("FCC" or "Commission") Notice of Proposed Rulemaking proposing the creation of a new universal service support mechanism for broadband services in rural areas, the Rural Digital Opportunity Fund.[1] Having participated in the original Connect America Fund Phase II ("CAF II") auction in 2018, Big River supports the FCC proposal to provide approximately $22 billion of additional funding for universal service ("USF") to ensure that broadband is available throughout the United States. And, in general, Big River supports the proposed changes made in the rules included in the NPRM. However, as explained below, the requirements to qualify for USF must reflect both the implications of how current and prospective broadband consumers use broadband networks as well as how service providers design their networks to meet customers' demands. To that end, Big River suggests some modifications to the proposed rules.

Usage of broadband networks have changed fairly significantly, even since the establishment of the rules that were promulgated for the CAF II auction. More and more,

[1] *Rural Digital Opportunity Fund, Connect America Fund,* WC Docket Nos. 19-126, 10-90, Notice of Proposed Rulemaking, FCC 19-77 (rel. Aug. 2, 2019) ("*NPRM"*).

broadband networks are used to deliver streaming media, as well as to download various forms of media, games, software and operating system updates. In addition, users still continue to browse the web, send and receive emails, share files, and participate in social media venues of one sort or another. It is expected that these sorts of usage patterns will continue into the future and most likely be augmented with the network traffic created by consumers interacting with the growing number of devices in their homes that are network addressable. Broadband networks, especially those that are supported by funds as proposed in the NPRM, should adequately support those characteristics that enable these sorts of uses. To that end, Big River believes that the emphasis on the weighting of the FCC proposed performance tiers should be focused on speed and data consumption which is consistent across all of the use cases for modern broadband networks. Such is not the case with regard to the implications of latency across these use cases and, in fact, much of the data that comes across broadband networks today show little impact on the consumer's experience even when latency is several hundred milliseconds ("ms").

To that end, Big River agrees with the Performance Tiers related to transmission speeds proposed in the NPRM which has eliminated the Minimum (> 10/1 Mbps) category that was included in CAF II. Current and future demands of broadband networks have gone beyond the capabilities of networks limited to those speeds.

Further, Big River agrees with the Monthly Usage Allowances included in the proposed Performance Tiers. A baseline of at least 150 GB of monthly usage remains a reasonable standard for entry level broadband networks.

However, there have been a number of other ways service performance is being improved. For example, with regards to latency, service providers have also taken steps to mitigate the impact of latency experienced by their customers in various ways. In today's

telecommunications environment, broadband networks are increasingly becoming hybrid in nature – using two or more disparate access technologies to a customer's location. These capabilities have been the focus of significant innovation, and have evolved where service providers are now using multiple technologies and/or paths to connect to the consumer. Service providers use advanced algorithms that intelligently use the multiple-paths to deliver the required performance, capacity and coverage to users for the type of data that is being delivered. This approach, especially in regard to latency, renders a single latency standard to be inappropriate.

These methods, i.e. using multiple paths, allow providers to deploy more cost-effective networks, allowing the Commission to support service to more locations within its finite budget. Accordingly, Big River urges the Commission to revisit its bid weighing system to address the reality of the use of hybrid communications networks to meet consumers' needs especially in regard to latency. As a result, bidders would be able to formulate bids based on a hybrid network composed of different networks with different performance characteristics.

The use of hybrid networks results in relatively higher latency for lower-sensitivity traffic as packets are queued so that higher-sensitivity packets may be sent first. Indeed, this is done by every provider offering a Voice-over-IP ("VOIP") service today – in order to ensure adequate call quality, the packets that are identified to be part of the VOIP traffic flow are prioritized and sent with minimal queueing, and if needed, another simultaneous, non-VOIP traffic will have its packets queued if they arrive at the same time as a VOIP packet.

This queueing and differential latency is necessary, because with a single network connection, the "pipe" must be shared with all of the traffic – only a single packet can be sent at a time. However, the introduction of hybrid or multi-path network technology breaks this paradigm, since it may be possible to use two different network paths simultaneously. An

analogy of this hybrid network approach is in the use of Carrier Aggregation in wireless networks, which allows a piece of User Equipment ("UE") to simultaneously transmit via two different channels. Due to the scarcity of spectrum available to network operators, and due to the different characteristics of spectrum at different frequencies, a provider may also need to bond, or aggregate, multiple channels, or even multiple technologies, in order to deliver the desired level of service to an end user. For example, a provider may choose to use both TV White Space ("TVWS") spectrum, supplemented with Citizens Broadband Radio Service ("CBRS") spectrum, in order to deliver a combined speed of 25 Mbps or higher.

Allowing bidders to provide service in the Rural Digital Opportunity Fund to leverage hybrid networks, the Commission can help ensure that the most cost-effective network configurations can be deployed. This will result in the Commission being able to fund broadband service to more Americans with the specified budget amount.

For the foregoing reasons, Big River urges the Commission to adopt the Rural Digital Opportunity Fund rules consistent with these comments. Doing so, will ensure that the latest networks will be included in USF and will able to bring the most advanced broadband services to consumers.

Respectfully submitted,

BIG RIVER COMMUNICATIONS

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